Remarks/Arguments

Applicant has received and carefully reviewed the Final Office Action mailed December 6, 2005, setting a three month shortened statutory period for response ending March 6, 2006. Claims 1-28, 30, 32, and 33 are pending. Reexamination and reconsideration are respectfully requested.

Allowable Subject Matter

Applicant thanks the Examiner for indicating that claims 3-8 and 13 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Rejections under 35 U.S.C. § 102(b)

Claims 1, 2, 9-12, 14-28, 30 and 32 are rejected as being anticipated by Corrado et al. (US 5,890,085). Applicant respectfully traverses the rejection.

Independent claim 1 recites "a plurality of sensors each providing a location of the moving inanimate object with an associated sensor uncertainty distribution." Claim 1 further recites "a data processor configured to read location data from two or more sensors, wherein said data processor combines the location data and the associated sensor uncertainty distributions from said two or more sensors and generates a value indicative of the most likely position of the moving inanimate object. Corrado et al. do not appear to teach such a system.

Corrado et al. teach a system of infrared and ultrasound sensors for detecting the presence or absence, orientation, and nature of a passenger in a car seat, and to determine whether or not to disable the air bag system. See column 3, line 48 through column 4, line 5. The Examiner cites to Figure 23 of Corrado et al. as suggesting a plurality of sensors that each provide a location of a moving inanimate object with an associated sensor uncertainty distribution. However, Figure 23 only appears to show that each sensor has an associated PD (Probability of Correct Detection) and PFA (Probability of an Incorrect Detection - False Alarm) value. The PD and PFA values are, however, shown as discrete values - and not uncertainty distributions as recited in claim 1. For

example, Sensor 1 of Corrado et al. has a PD equal to a discrete value of 0.3, which appears to represent the probability of detecting a rear facing child seat, and a PD equal to a discrete value of 0.90, which appears to represent the probability of detecting an occupant in the adjacent seat. Likewise, Sensor 2 has a PD equal to a discrete value of 0.99, which appears to represent the probability of detecting a rear facing child seat, and a PD equal to a discrete value of 0.90, which appears to represent the probability of detecting an occupant in the adjacent seat. As can readily be seen, the PD and PFA values shown in Figure 23 of Corrado et al. are not uncertainty <u>distributions</u>, as recited in claim 1, but rather are discrete values.

One skilled in the art would clearly understand the difference between a discrete value as shown in Figure 23 of Corrado et al. and an uncertainty <u>distribution</u>. The present specification states:

> For each sensor available for locating and tracking an object, a probability <u>distribution</u> may be determined based on the reported estimated position of the object and the performance characteristics of the sensor. As shown in Figure 4, example curve 412 may represent the probability <u>distribution</u> of the estimated position of the object as determined by sensor 12. Likewise, example curve 416 may be the probability <u>distribution</u> of the estimated position of the object as determined by sensor 16. Example curve 420 may indicate the probability <u>distribution</u> of the estimated position of the object as determined by sensor 20, and example curve 424 may represent the probability distribution of the estimated position of the object as determined by sensor 24. As before, the four probability <u>distributions</u> corresponding to the four sensors are merely illustrative in nature.

(Emphasis Added) (Specification, page 6, line 18 through page 7, line 4; Figure 4). The curves shown in Figure 4 of the present specification clearly show <u>distributions</u>, and not single discrete values. The use of distributions, rather than discrete values, may produce a more accurate result (e.g. less uncertainty in the position of the object), which is highly desirable in some applications such as air traffic control applications.

Because Corrado et al. fails to disclose or suggest "a plurality of sensors each providing a location of the moving inanimate object with an associated sensor uncertainty <u>distribution</u>", Corrado et al. must also fail to disclose or suggest "a data processor configured to read location data from two or more sensors, wherein said data processor

combines the location data and the associated sensor uncertainty distributions from said two or more sensors and generates a value indicative of the most likely position of the moving inanimate object." As noted in MPEP § 2131:

> **TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM**
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> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

In the present case, Corrado et al. clearly fails to disclose or suggest each and every element of claim 1. In addition, Corrado et al. does not appear to provide any suggestion or motivation for using distributions, as claimed. For these and other reasons, claim 1 is believed to be clearly patentable over Corrado et al. For similar and other reasons, claims 2-28, 30, 32-33 are also believed to be clearly patentable over Corrado et al.

Specifically with respect to dependent claim 9, the Examiner cited to Figures 20-21 for suggesting a data processor that is configured to determine a probability distribution for a position of the object based on the location data and the associated sensor uncertainty distribution from each of the at least two sensors. Claim 9 recites:

> 9. (Previously Presented) The system of claim 1 wherein the data processor is configured to determine a probability distribution for a position of the object based on the location data and the associated sensor uncertainty distribution from each of the at least two sensors.

With respect to Figures 20-21, Corrado et al. state:

> For example, in referring to FIG. 20, an IRF5 value of 1.2 and an IRF1 value of 1.2 would result in a high confidence value for the OOP state and 0 for other states; an IRF5 value of 3 and an IRF1 value of 1 will have a confidence level of 0 for all the states; and an IRF5 value of 2 and an IRF1 value of 3.3 will have a low confidence value for the RFCS state and 0 for other states. For each feature vector, there are a number of these possible fused vector components and their associated confidence levels. The output of the feature and fused feature processing block is a matrix, called the detection and confidence matrix (e.g. Infrared Feature Detection and Confidence Matrix), shown graphically FIG. 21. Note that a fused vector may fuse two or more feature vector components.

(Corrado et al., column 21, lines 18-31). As can be seen, Figure 20 appears to merely correlate two feature vector component values (e.g. IRF1 and IRF5) with one of three states, namely, the RFCS (Rear Facing Child Seat) state, the OOP (Out-Of-Position passenger) state and the empty state. Nothing here suggests a data processor that is configured to determine a probability distribution for a position of the object "based on the location data AND the associated sensor uncertainty distribution from each of the at least two sensors", as recited in claim 9. In fact, and as noted above, Corrado et al. do not appear to disclose or suggest "a plurality of sensors each providing a location of the moving inanimate object with an associated sensor uncertainty distribution". For these additional reasons, claim 9 is believed to be clearly patentable over Corrado et al.

Specifically with respect to claim 11, the Examiner again cited to Figures 20-21. Claim 11 recites:

> 11. (Original) The system of claim 9 wherein each probability distribution for the position of the object is segmented into a plurality of sub-ranges.

As can be seen, claim 11 recites that each probability distribution for the position of the object is segmented into a plurality of sub-ranges. As noted above, Corrado et al. teaches a system of infrared and ultrasound sensors for detecting the presence or absence, orientation, and nature of a passenger in a car seat, and to determine whether or not to disable the air bag system. See column 3, line 48 through column 4, line 5. Corrado et al. does not appear to disclose, teach or suggest determining the position of an object. As noted above, Figure 20 of Corrado et al. appears to merely correlate two feature vector component values (e.g. IRF1 and IRF5) with one of three states, namely, the RFCS (Rear Facing Child Seat) state, the OOP (Out-Of-Position passenger) state and the empty state. The so-called sub-ranges shown in Figure 20 of Corrado et al. appear to show a confidence level for each of the three states based on the discrete values of IRF1 and IRF5. The three states, however, do not signify a "position" of an object, as described in the present specification, but rather signify the presence or absence, orientation, and nature of a passenger in a car seat, to determine whether or not to disable the air bag system.

Specifically with respect to claim 12, which recites:

> 12. (Original) The system of claim 11 wherein each sub-range has an associated probability value indicative of the likely position of the object within the sub-range.

As can be seen, claim 12 further recites that each sub-range has an associated probability value indicative of the likely position of the object within the sub-range. As noted above, Figure 20 of Corrado et al. appears to merely correlate two feature vector component values (e.g. IRF1 and IRF5) with one of three states, namely, the RFCS (Rear Facing Child Seat) state, the OOP (Out-Of-Position passenger) state and the empty state. The so-called sub-ranges shown in Figure 20 of Corrado et al. appear to show a confidence level for each of the three states based on the discrete values of IRF1 and IRF5. The three states, however, do not signify a "position" of an object, and more particularly, each so-called sub-range of Corrado et al. do not appear to have "an associated probability value indicative of the likely position of the object within the sub-range", as recited in claim 12.

Specifically with respect to claim 15, which recites:

> 15. (Original) The system of claim 1 wherein a conjunctive fusion method is applied to a plurality of parameters affecting sensor reliability, said method providing an estimation of intersection points of probability measures by identifying the sub-range with the most likely probability of defining the object's position.

Nothing in Corrado et al. appears to disclose or suggest applying a conjunctive fusion method to a plurality of parameters affecting sensor reliability, or providing an estimation of intersection points of probability measures by identifying the sub-range with the most likely probability of defining the object's position.

Other dependent claims are also believed to be clearly patentable over Corrado et al. for similar and other reasons.

On page 3 of the Office Action, the Examiner rejected claims 1-2, 9-12, 14-21, 24, 26-27 and 33 under 335 U.S.C. 102(e) as being anticipated by Hehls III (USPUB 2002/0120391). Applicant respectfully traverses the rejection.

As noted above, independent claim 1 recites "a plurality of sensors each providing a location of the moving inanimate object with an associated sensor uncertainty distribution." Claim 1 further recites "a data processor configured to read location data

from two or more sensors, wherein said data processor combines the location data and the associated sensor uncertainty distributions from said two or more sensors and generates a value indicative of the most likely position of the moving inanimate object.

Hehls does not appear to specifically disclose a plurality of sensors each providing a location of the moving inanimate object with an associated sensor uncertainty distribution. The Examiner cited to item 206 of Figure 8 as disclosing this feature. However, this does not appear to specifically teach "a plurality of sensors each providing a location of the moving inanimate object with an associated sensor uncertainty distribution", as recited in claim 1. As noted above:

TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Because Hehls does not appear to specifically disclose a plurality of sensors each providing a location of the moving inanimate object with an associated sensor uncertainty distribution, claim 1 is clearly not anticipated by Hehls. For similar and other reasons, claims 2, 9-12, 14-21, 24, 26-27 and 33 are also clearly not anticipated by Hehls.

The Examiner may be tempted to reject claims 1-2, 9-12, 14-21, 24, 26-27 and 33 under 35 U.S.C. § 103 as being obvious in view of Hehls. However, Hehls was filed on February 26, 2001 and issued on April 1, 2003 as US Patent No. 6,542,809. The present application was filed on October 22, 2001. As such, Hehls would only qualify as prior art under 35 U.S.C. §102(e)/103.

35 U.S.C. § 103(c) states:

35 U.S.C. 103. Conditions for patentability; non-obvious subject matter.

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(c) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the

> subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

35 U.S.C. 103(c) applies to all utility, design and plant patent applications filed on or after November 29, 1999, which includes the present application. The subject matter of Hehls and the subject matter of the present application were, at the time the invention was made, owned by or subject to an obligation of assignment to a common assignee, namely, Honeywell International Inc., of Morristown, New Jersey, U.S.A. In view of the foregoing, Hehls is disqualified as prior art under 35 U.S.C. § 103.

In view of the foregoing, it is believed that all pending claims 1-28, 30, 32 and 33 are in condition for allowance. Issuance of a notice of allowance in due course is respectfully requested. If a telephone conference would be of assistance, please contact the undersigned attorney at 612-359-9348.

Respectfully submitted,

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